

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A heat transport device comprising:
a container having opposed first and second ends, a hollow structure including a fluid channel extending between the first and second ends, the first and second ends of the fluid channel being closed to prevent intrusion of external air, and a liquid and a gas sealed in the fluid channel;
driving heat exchangers located at respective terminal portions of the container for causing the liquid to oscillate along the fluid channel by boiling the liquid;
at least one thermal-receiver heat exchanger receiving heat from an external heat source and located outside of and on an outer wall of the container at a first position along the fluid channel, ~~between the first and second ends~~ driving heat exchangers; and
at least one thermal-radiator heat exchanger radiating heat from the container and located outside of and on the outer wall of the container at a second position along the fluid channel, ~~between the first and second ends~~ driving heat exchangers, the first and second positions being spaced from each other and serially arranged along the fluid channel; ~~and driving heat exchangers located at respective terminal portions of the container for causing the liquid to oscillate along the fluid channel.~~
2. (Previously Presented) The heat transport device according to claim 1, wherein at least one of the terminal portions of the container where one of the driving heat exchangers is located has, in cross-section, an internal corner.
3. (Previously Presented) The heat transport device according to claim 1, wherein the terminal portions of the container have a larger cross-sectional area than other portions of the container.
4. (Original) The heat transport device according to claim 1, wherein each of the driving heat exchangers includes a heating unit and a cooling unit.
5. (Previously Presented) The heat transport device according to claim 1, wherein each terminal portion of the container where one of the driving heat exchangers is located has an internal volume at least equal to internal volume of a portion of the container bounded by

a center of the thermal-receiver heat exchanger and a center of the thermal-radiator heat exchanger.

6. (Currently Amended) The heat transport device according to claim 1, wherein the liquid is a combination of immiscible liquids having different boiling points, the liquid with a lower boiling point is sealed in one of the terminal portions of the container, and the liquid with the higher boiling point is sealed in a portion of the container ~~different from~~ between the terminal ~~portion~~ portions containing the lower boiling point liquid.

7. (Previously Presented) The heat transport device according to claim 1, wherein each terminal portion of the container where one of the driving heat exchangers is located has a double pipe structure.

8. (Previously Presented) The heat transport device according to claim 1, including a pore producing capillary action located inside at least one of the terminal portions of the container where the driving heat exchangers are located.

9. (Previously Presented) The heat transport device according to claim 1, including a recess as a nucleus for bubble formation located in at least one of the terminal portions of the container where the driving heat exchangers are located.

10. (Previously Presented) The heat transport device according to claim 1, wherein the fluid channel is a meandering fluid channel.

11. (Previously Presented) The heat transport device according to claim 10, including a single wall separating adjacent portions of the meandering fluid channel.

12. (Previously Presented) The heat transport device according to claim 11, including a bypass hole, which allows the liquid to pass, in the single wall between the adjacent portions of the meandering fluid channel.

13. (Previously Presented) The heat transport device according to claim 12, wherein at least one of the thermal-receiver heat exchanger and the thermal-radiator heat exchanger is located on a portion of an outer wall of the container where the bypass hole is located.

14. (Previously Presented) The heat transport device according to claim 10, wherein the driving heat exchangers include a Peltier element, and the terminal portions of the container are joined to each other via the Peltier element.

15. (Previously Presented) The heat transport device according to claim 1, wherein the container has a portion including a flexible material.

16. (Currently Amended) The heat transport device according to claim 1, wherein the liquid is caused to oscillate in directions along the fluid channel by heating and cooling by the driving heat exchangers, the heat transport device further comprising a controller for controllably switching the driving heat exchangers between heating and cooling cycles, based on temperatures of the driving heat exchangers detected by the controller.

17. (Previously Presented) The heat transport device according to claim 1 comprising multiple containers located adjacent to each other, wherein the driving heat exchangers are switched between heating and cooling cycles with different timings.

18. (Currently Amended) A semiconductor apparatus comprising:
a semiconductor device having a heat-generating portion; and
a heat transport device comprising:

a container having opposed first and second ends, a hollow structure including a fluid channel extending between the first and second ends, the first and second ends of the fluid channel being closed to prevent intrusion of external air, and a liquid and a gas sealed in the fluid channel;

driving heat exchangers located at respective terminal portions of the container for causing the liquid to oscillate along the fluid channel by boiling the liquid;

at least one thermal-receiver heat exchanger receiving heat from an external heat source and located outside of and on an outer wall of the container at a first position along the fluid channel, between and spaced from the first and second ends driving heat exchangers; and

at least one thermal-radiator heat exchanger radiating heat from the container and located outside of and on the outer wall of the container at a second position along the fluid channel, between the ~~first and second ends driving heat exchangers~~, the first and second positions being spaced from each other and serially arranged along the fluid channel; ~~and driving heat exchangers located at respective terminal portions of the container for causing the liquid to oscillate along the fluid channel~~, wherein the thermal-receiver heat exchanger is

located immediately adjacent to the heat-generating portion which generates heat when said semiconductor device is in operation.

19. (Currently Amended) An extra-atmospheric mobile unit comprising:
a heat-generating portion; and
a heat transport device comprising:

a container having opposed first and second ends, a hollow structure including a fluid channel extending between the first and second ends, the first and second ends of the fluid channel being closed to prevent intrusion of external air, and a liquid and a gas sealed in the fluid channel;

driving heat exchangers located at respective terminal portions of the container for causing the liquid to oscillate along the fluid channel by boiling the liquid;

at least one thermal-receiver heat exchanger receiving heat from an external heat source and located outside of and on an outer wall of the container at a first position along the fluid channel, ~~between the first and second ends~~ driving heat exchangers; and

at least one thermal-radiator heat exchanger radiating heat from the container and located outside of and on the outer wall of the container at a second position along the fluid channel, ~~between the first and second ends~~ driving heat exchangers, the first and second positions being spaced from each other and serially arranged along the fluid channel; ~~and driving heat exchangers located at respective terminal portions of the container for causing the liquid to oscillate along the fluid channel~~, wherein the thermal-receiver heat exchanger is located immediately adjacent to the heat-generating portion which generates heat when the extra-atmospheric mobile unit is in operation.